

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

|                                   |   |                      |
|-----------------------------------|---|----------------------|
| In the Matter of                  | ) |                      |
|                                   | ) | GEN Docket No. 00-32 |
| The 4.9 GHz Band Transferred from | ) |                      |
| Federal Government Use            | ) |                      |
|                                   | ) |                      |

**COMMENTS  
OF THE OFFICE OF THE CHIEF TECHNOLOGY OFFICER,  
GOVERNMENT OF THE DISTRICT OF COLUMBIA**

The Office of the Chief Technology Officer of the Government of the District of Columbia (“OCTO”) is pleased to respond to the Notice of Proposed Rulemaking (“Notice”) in the captioned proceeding, FCC 02-47<sup>1</sup>. OCTO operates Public Safety Networks in the District of Columbia and therefore has strong interest in the outcome of this proceeding.

**INTRODUCTION/SUMMARY**

In this document, we demonstrate that the spectrum requirements of Public Safety for on-scene communications management and broadband applications require that the entire 50 MHz allocation within the designated 4.9 GHz band be assigned to Public Safety. At the same time, we urge that, to maximize efficient use of the spectrum during non-emergency situations, the Commission should allow Public Safety to develop sharing agreements with federal agencies and/or critical utilities, that would extend interoperability and provide safe, accessible spectrum for these entities. These sharing arrangements should be approved and coordinated by the licensed Public Safety agency based on a formal request for access to the spectrum. We also

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<sup>1</sup> FCC 02-47, “In the Matter of The 4.9 GHz Band Transferred from Federal Government Use, WT Docket NO 00-32, Second Report and Order and Further Notice of Proposed Rulemaking” (February 27, 2002).

advocate the implementation of a channel plan that is anchored on existing, frequency-modified standard technologies; that minimizes interference to adjacent radio astronomy users; and that provides access for limited coordinated/airborne applications. We believe these regulatory conditions will promote rapid development of cost-effective, interference-managed, flexible technologies and applications in the best interest of Public Safety and the general public.

### **LIMITATION OF 4.9GHZ BAND TO PUBLIC SAFETY**

The Public Safety Wireless Network (“PSWN”) Association recognized, in its “Spectrum Issues And Analysis Report” of December 1999<sup>1</sup>, that Public Safety radio spectrum must be increased by 73.5 MHz in the short term to address immediate Public Safety spectrum requirements. The PSWN reached this conclusion as the result of a Public Safety Wireless Committee (“PSWAC”) study that identified the need for those 73.5 MHz, over and above the 24 MHz already allocated to Public Safety in the 700 MHz band, to meet the expanded spectrum demand that broadband and video applications require, and to realize the extraordinary benefits of these applications for public safety.

In addition, as Motorola demonstrated in its ex parte<sup>2</sup> White Paper, numerous Public Safety entities across the nation have emphasized their growing needs for broadband multimedia communication at incident scenes. As those Public Safety groups explain in their comments, and as the FCC recognizes in the Notice<sup>3</sup>, the 700 MHz band will not provide the bandwidth needed to satisfy the capacity requirements of these essential broadband applications.

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<sup>1</sup> PSWN, “Spectrum Issues And Analysis Report” (December 1999), p. II-3.

<sup>2</sup> Motorola, “4.9 GHz Allocation to Public Safety: Motorola White Paper for Submission to FCC” (July 31, 2001) (hereinafter, “Motorola White Paper”) pp. 4-6.

<sup>3</sup>Notice, pp. 13-14.

Moreover, the Association of Public-Safety Communications Officials (“APCO”), the National Association of Counties, the National League of Counties, and the National Association of Telecommunications Officers and Advisors pointed out in their joint comment on the Notice of Proposed Rulemaking addressing the 800 MHz band<sup>4</sup> that since the PSWAC analysis, cited above, Public Safety spectrum needs have actually increased, and the spectrum recommendations should be updated to reflect the current state of the industry. The increased demand is due to technology evolution (e.g., computer processing capabilities and access to databases via the Internet), expanded reliance of law enforcement and other public safety agencies on broadband applications, and the need to strengthen security at public places and events since the tragedy of September 11, 2001.

Two recent industry statements illustrate specific Public Safety broadband applications required on-scene in emergencies and support OCTO’s spectrum usage and management recommendations. The Motorola White Paper<sup>5</sup> demonstrates that spectrum needs in a large building fire scenario -- including communications support for firefighters, command and support staff, ambulances and paramedics, robots, police staff, and surveillance helicopters -- would be 50.2 MHz for an incident area with a 100-meter radius. The Mobility for Emergency and Safety Applications (“MESA”) project, a joint effort by the Telecommunications Industry Association (“TIA”) and the European Telecommunications Standard Institute (“ETSI”) to define a global Public Safety technology standard, assessed the spectrum needs for a catastrophe

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<sup>4</sup> Association of Public-Safety Communications Officials, National Association of Counties, National League of Counties, and National Association of Telecommunications Officers and Advisors, Comment on the Notice of Proposed Rulemaking, FCC 02-81 “In the Matter of Improving Public Safety Communications in the 800 MHz Band” (May 6, 2002).

<sup>5</sup> Motorola White Paper, pp. 11-14.

with a 500m-radius scene to be 70 MHz<sup>6</sup>. The spectrum needs identified in the MESA scenario – a train derailment – included communications support for EMS staff, shuttling ambulances, hazardous material staff, firefighters, fire trucks, rescue squad members, robots (implying video links), law enforcement officers, video surveillance for ground transport logistics, and road access and route assistance.

These examples show that 50 MHz bandwidth of on-scene broadband communications spectrum is the absolute minimum necessary to address Public Safety requirements. Although dire events such as a railway derailment occur infrequently, they do occur. It is imperative that Public Safety be prepared to respond, as human lives are in the balance.

We recognize that the FCC has made a significant commitment by allocating to Public Safety 50 MHz in the 4.9 GHz band. However, as explained above, 50 MHz will barely support Public Safety requirements. Moreover, in disaster scenarios such as those described above, spectrum sharing with commercial entities and others, in the absence of Public Safety management, creates unacceptable risks. Since the location and timing of such tragedies is unpredictable, eligibility to use the 4.9 GHz should be restricted to Public Safety.

### **EFFICIENT USE OF SPECTRUM THROUGH SHARING AGREEMENTS**

The propagation characteristics at the 4.9 GHz frequency band are such that ground-to-ground transmission distance ranges are reasonably short, and thus it is possible to reuse the same frequencies for other ground-to-ground applications in the same city. For this reason, although this spectrum should be allocated solely to Public Safety entities, the regulation should afford them flexibility to enter into agreements with other entities to share their spectrum for

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<sup>6</sup> Steffen Ring, Chairman, Project MESA Steering Committee, “Train Crash Scenario - A Draft Spectrum Assessment Example.”

limited ground-to-ground operations. Those agreements should include priority access clauses that would allow Public Safety to respond as required in emergencies. The Public Safety licensee would manage the priority access levels of the regionally authorized entities sharing the spectrum based on rules defined by each local entity. Each user of the band would be required to agree to the rules beforehand. These agreements might include the possibility of service interruption for the sharing entities other than Public Safety.

Entities allowed to share the spectrum with Public Safety should be limited to federal law enforcement and emergency management agencies, and critical infrastructure entities such as utilities that play key roles in emergencies. Because of the necessity of coordination “on the fly” when an emergency situation arises, as noted above, we believe that commercial applications should be excluded from the 4.9 GHz band. As they generally serve numerous customers, they would make the coordination process extremely complicated, increase spectrum congestion, and raise the risk of interference with critical on-scene emergency applications in the band. Moreover, the general public has access to commercial wideband wireless appliances and applications through 802.11a and 802.11b technologies in the unlicensed band.

Sharing agreements will permit the most efficient use of the spectrum in non-emergency situations. At the same time, such agreements will enhance protection of life and health, by providing coordinated access to the 4.9 GHz spectrum to public safety entities.

### **USE OF THE SPECTRUM FOR FIXED SERVICES**

The needs for wireless communications at an incident scene are unpredictable, and thus, as discussed earlier, Public Safety entities need the full spectrum in 4.9 GHz to meet the communication demands of such situations. Public Safety should be permitted to use the spectrum as desired for mobile or fixed services, even point-to-point, as depending on the

specific requirements of the agency. Fixed operations should be limited to an EIRP of 20 dBW to better manage cross regional interference.

### **STANDARDIZED TECHNOLOGY IN THE 4.9 GHZ BAND**

We urge the Commission to require Public Safety agencies to standardize technology to be used in the 4.9 GHz band. As numerous reports illustrate<sup>7</sup>, nearly 90% of local Fire and EMS agencies need to interoperate with other local agencies on a daily basis. As the FCC itself recognizes in its Notice, and as most Public Safety comments suggest, the 4.9 GHz band should be dedicated to on-scene incident communications management, where by definition, multiple local Public Safety agencies are involved. The scenarios developed by Motorola and MESA are a perfect illustration that the successful handling of such critical events depends on a smoothly integrated management of the diverse Public Safety resources deployed at the incident. Such interoperability requirements can be met only if all units deployed communicate on a common defined standard.

OCTO proposes a technology implementation that:

- optimizes the use of the spectrum by implementing proven spectrum-efficient technologies,
- permits easy interoperability and minimizes costs by implementing existing technology standards with slight enhancements, and
- minimizes interference to secondary users in the band and adjacent bands.

We propose a channel plan that includes three channels within the 50 MHz allocation, one 10 MHz channel in the lower part of the band, and two 20 MHz wide channels occupying the upper part of the band. We strongly recommend that the two 20 MHz channels use the 802.11a

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<sup>7</sup> PSWN, “Spectrum Issues And Analysis Report” (December 1999), p. IV-1.

technology for interoperability in the upper part of the band. This part of the band is closer to the 5GHz U-NII band for which 802.11a has been designed. The 801.11a standard is very robust, can be made immediately available for incident application, and only requires a minor frequency modification. Additionally, it is possible that terminals would be able to use both the U-NII 802.11a spectrum and the Public Safety spectrum. This would provide Public Safety agencies flexibility in accessing spectrum, since they would be able to use some extra capacity in the U-NII band, if available. Another advantage of this technology is that it is a common standard, and therefore, it will not only facilitate interoperability, but will also minimize equipment costs. While additional enhancements are required, including security features such as encryption and authentication to access the network, as well as some mobility management features to allow for interoperability operations, these modifications are manageable.

The output power limits of the equipment should be the same as those specified by the 802.11a standard, e.g., up to 1 Watt. However, to protect the safety of on-scene personnel, the transmitted power and antenna used on the portable equipment, in particular, should be limited to values compatible with the RF exposure limits defined by the FCC's current rules<sup>8</sup>.

We urge the use of the remaining lower 10 MHz channel for low power/low altitude (not to exceed 1,500 feet) airborne video links and other flexible and standardized alternative technologies and applications. Air surveillance and tracking is a critical Public Safety need. Major emergency events involve heavy requirements for ground transport logistics and road access and route assistance. Video air surveillance is an efficient management tool for addressing these needs. In addition, daily law enforcement operations such as vehicle chases, crowd control

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<sup>8</sup> See Report and Order, FCC 96-326.

and hostage situations require the support of airborne applications. Therefore, a part of the 4.9 GHz band should be reserved for airborne and alternative applications.

Appropriate management of the lower 10 MHz channel will not interfere with radio astronomy. Because radio astronomy observatories are located in “quiet zones” far from major urban centers where most Public Safety communication needs occur, it is unlikely that a helicopter video link or similar application will disturb radio astronomy receivers. In addition, the primary radio astronomy incumbents the FCC wants to protect are located in the 4990 MHz-5000 MHz band, well shielded by a 50 MHz separation from the airborne video links channels.

Even so, in the areas where airborne Public Safety could potentially interfere with radio-astronomy applications because of closer geographical proximity, as well as in the rest of the country, the FCC should implement proper measures to prevent interference. Airborne public safety frequencies should be coordinated with observatories when used within 50 miles of the observatories’ quiet zones. This coordination would be the responsibility of the Public Safety Regional Planning Committees. In addition, technical limitations such limiting transmitted ERP should be implemented to further reduce interference, and the maximum flight altitude admissible should be defined and enforced by the Commission.

### **SPECTRUM MANAGEMENT AND LICENSING**

OCTO recommends that licensing of the full 50 MHz allocation be conducted in a manner similar to 700 MHz spectrum in that all states, territories and the District of Columbia should be licensed for the entire 50 MHz. We recommend that coordination be conducted at the current Regional Planning Committee level, but that coordination be limited to management of interference disputes between regional boundaries. By adopting limited power output, as currently mandated in the 802.11a standard, and by limiting fixed service power, the burden of



administering the spectrum between regional entities can be minimized. The experience of the Regional Planning Committees has been very successful, and by adding a transmission power restriction and limiting the transmission from one licensee into the territory of an adjacent licensee to -100 dBm when measured at a distance of ¼ mile into the boundary of an adjacent licensed area, the Commission can enable Public Safety agencies to deploy 4.9 GHz infrastructure and applications, and avoid filings and paperwork typically associated with deploying stations.

## **CONCLUSION**

This NPRM offers the FCC the opportunity to provide Public Safety significant and greatly needed radio spectrum relief promptly, effectively, and prudently. By selecting available, well-proven standards and technologies to support implementation, the Commission can afford Public Safety access to inexpensive technologies to support immediate, secure broadband services. Our proposals will make efficient use of the spectrum allocated to Public Safety and facilitate an effective, simple and straightforward management of the coordination process.

Respectfully submitted,

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